



Hearing Conservation Program

OVERVIEW

- Identify noise hazards
- Verify personnel have appropriate hearing protection
- How to execute recommended risk mitigation factors
- Identify the supporting Industrial Hygienist

Background

- 30 million workers are exposed to harmful noise
- Hearing loss is 2nd most reported occupational illness
- Noise-induced hearing loss is irreversible
- Any amount of remaining hearing is worth saving
- Only 20-60% of workers use hearing protection
- **Hearing loss is almost 100% preventable!**

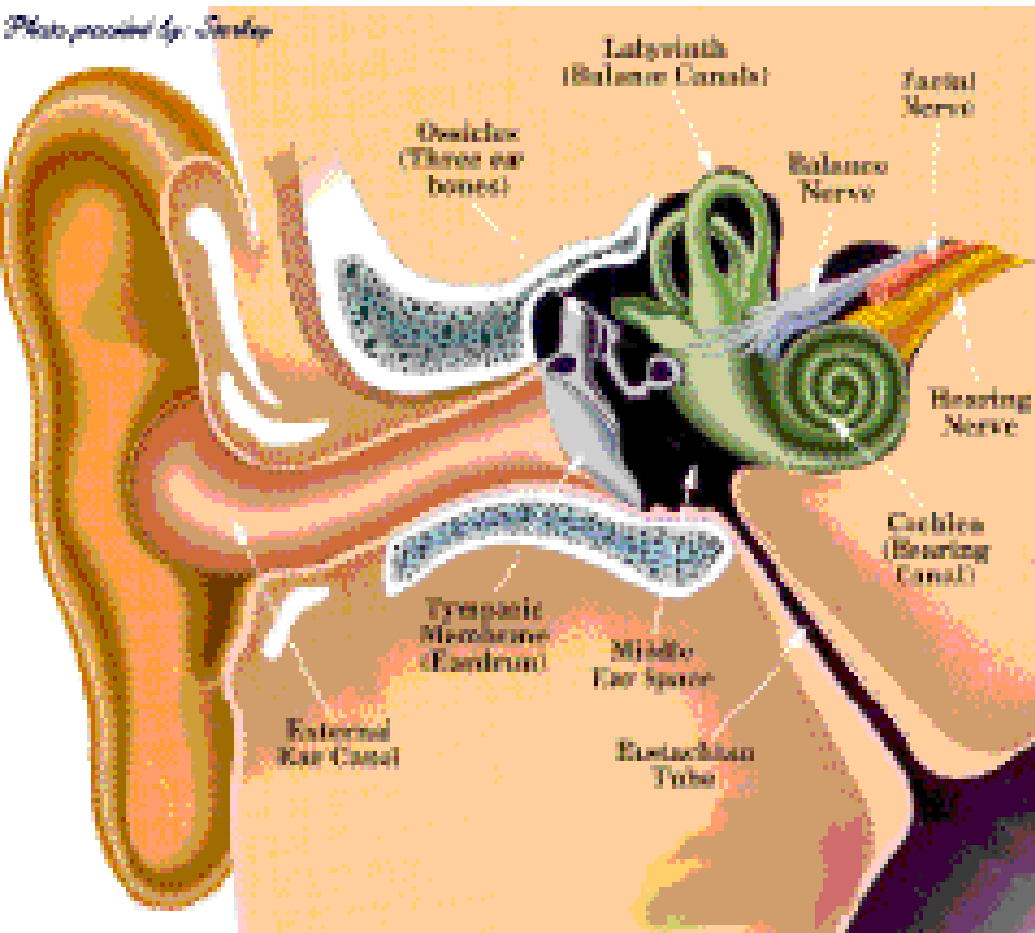
Marine Corps Hearing Conservation Program Goal

To prevent Marine Corps personnel from suffering occupational hearing loss due to noise exposure and ensure auditory fitness for duty in the Marine and civilian workforce.

Program Elements

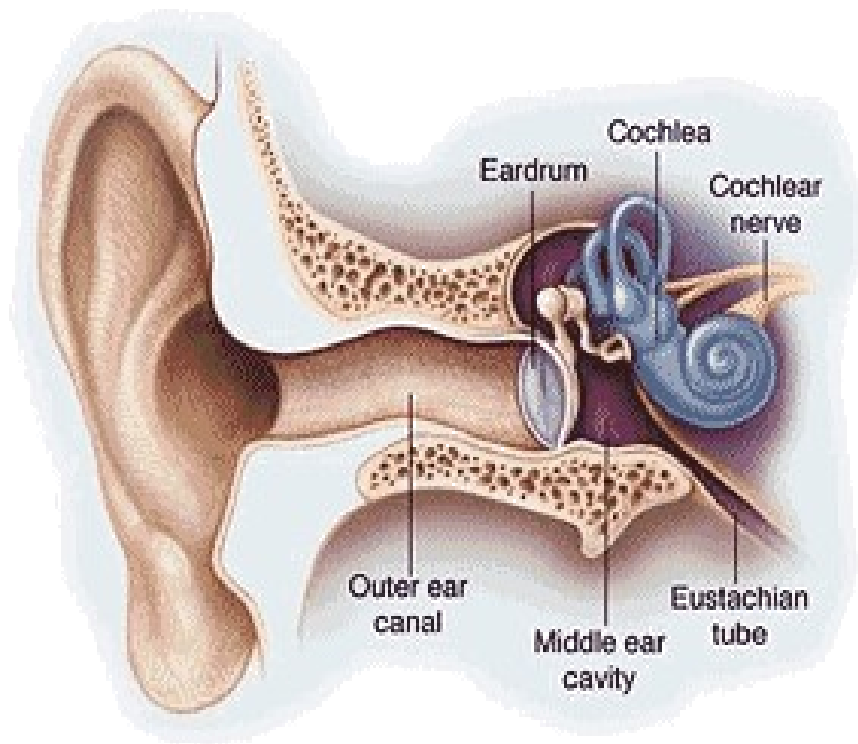
- Identify noise hazardous processes/areas via the IH survey
- Workplaces will be modified to reduce noise level to acceptable levels by engineering controls when feasible
- Periodic hearing test shall be conducted to monitor the effectiveness of the program
- Training
- Responsibilities

Causes of Hearing Loss



- Noise exposure
- Congenital disorders
- Genetic causes
- Infections
- Ototoxic drugs
- Head trauma

Effects of Noise Exposure



- Our ears can recover from short exposure to loud noise but over time nerve damage will occur
- The longer and louder the noise the greater chance permanent damage will occur
- There is no such

Effects of Noise

Exposure

- How long a person can be exposed without hearing protection before there is damage to the ear

Noise Level
Exposure Time

Allowable

84 decibels

8 hours

90 decibels

4 hours

100 decibels

1 hour

105 decibels

30 minutes

110 decibels

15 minutes

115 decibels

0 minutes

Effects of Noise Exposure



- Cumulative over time
- Not noticeable until years later
- Damaged hair-like cells in inner ear
- Can not be recovered

Common Sounds

		<u>dB</u>
Whisper	<i>Barely Audible</i>	10
Normal Conversation	<i>Audible</i>	78
	<i>Slightly Loud</i>	81
Air Conditioner	<i>Moderately Loud</i>	92
Lawn Mower	<i>Uncomfortably Loud</i>	120
Rock Concert		
Jet (taking off)	<i>Pain Threshold</i>	130

Hazardous Levels

- US Military
 - 84 dB (A) Continuous
 - 104 dB (A) Double
 - 140 dB (A) Impact
- OSHA
 - 90 dB (A)
- When in doubt, Arm's Rule Length

Noise Measurements



- In order to control noise hazards effectively, it is necessary that the noise levels be measured and properly documented in an IH survey

Noise Measurements cont.



- Noise measurements
 - Personal
 - Area
- 84 db(a) 8 hr-TWA for a 40 hour work week
- For impact or impulse noise
- 140 db PEAK

Multiple Noise Sources



Combined = 86 dB

Diff Between
Sound Source

0 - 1 dB

2 - 3 dB

4 - 8 dB

≥ 9

Add to higher

+ 3

+ 2

+ 1

+ 0

Multiple Noise Sources

○ = 83 dBA

Combined = 92

○ = 92 dBA

Diff Between
Sound Source
higher

0 - 1 dB

2 - 3 dB

+ 2

4 - 8 dB

Add to

+ 3

Noise Areas and Equipment

- Designated hazardous noise areas will be labeled with
 - **Hazardous Noise Warning Decal**
 - **“Hearing Protection Required” Caution Signs**

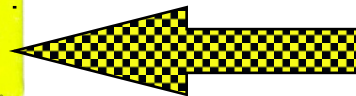
Posted Areas



➔ **Equipment / Area**

☐ **Hand Tools**

☐ **State Conditions**



Conditions

NAVME 6260/2
NSN: 0105-LF-7200

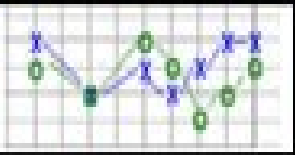
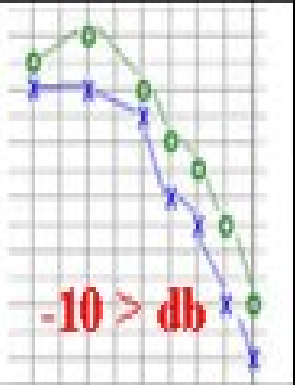
or Equivalent Sign

Audiometric Testing



- Most of us develop a mild hearing loss as we age
- A severe or significant hearing loss at a younger age may mean you have had excessive noise exposure
- Audiometric testing done annually can detect early stages of hearing loss

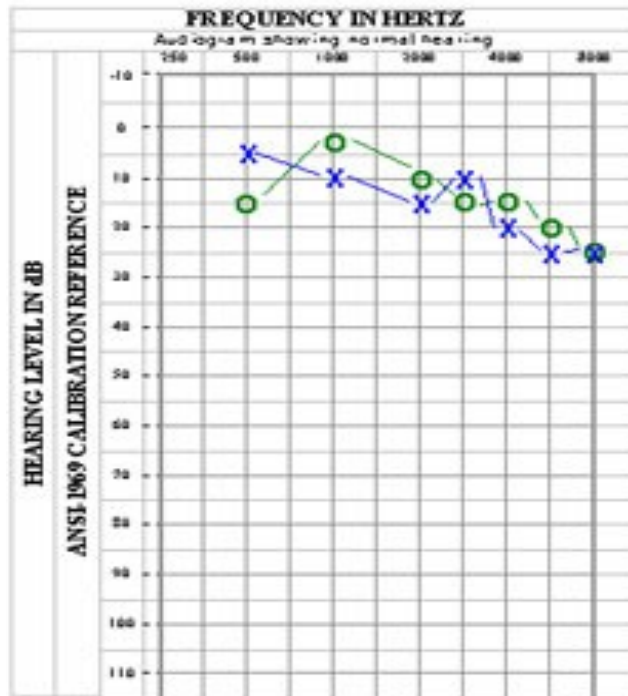
Audiometric Testing cont.

6 Mo's	Baseline	
Subsequent Year	Compared to Baseline	

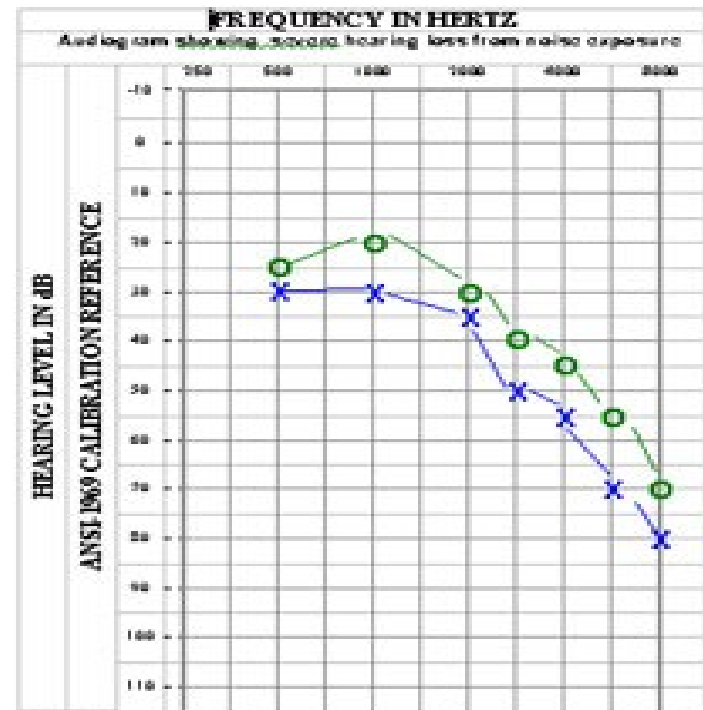
- Personnel enrolled in the Hearing Conservation Program will receive a baseline audiogram
- Annual hearing test will be compared to the baseline audiogram to determine if a significant threshold shift has occurred

Exclusion From Future Noise Exposure

- Personnel who exhibit a progressive series of permanent threshold shifts must be considered as high risk for future hearing deterioration and must be given special consideration under this program



Normal hearing

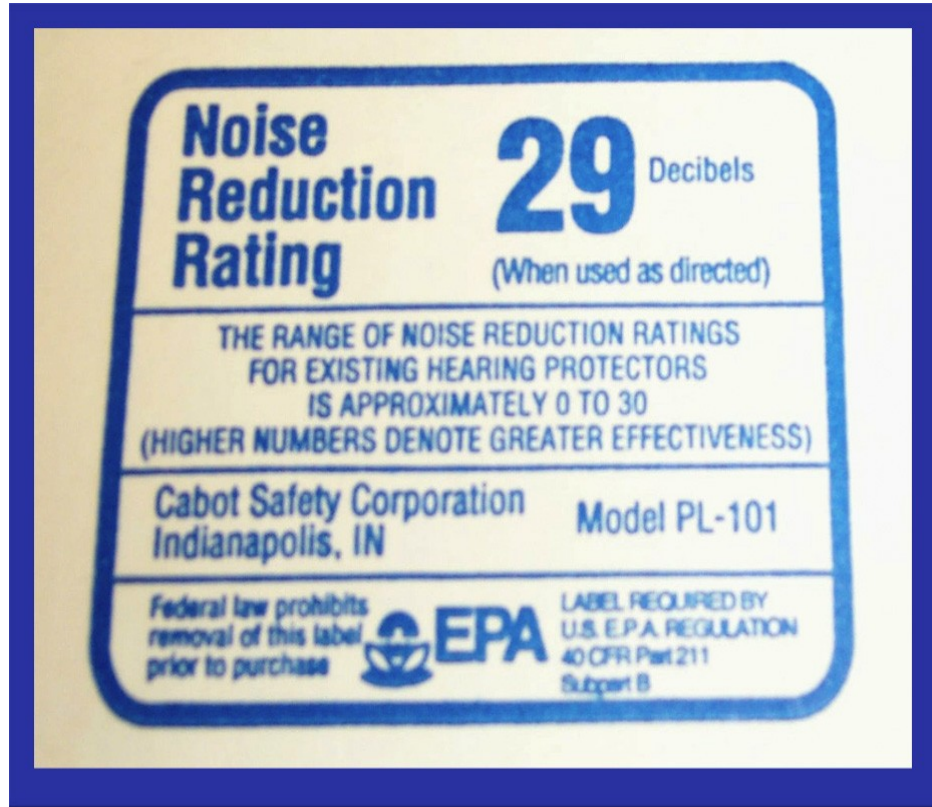


Severe hearing loss

Termination Audiogram

- Upon removal from the hearing conservation program
- Upon end of military service

Noise Reduction Rating



- The “noise reduction rating” or “NRR” of hearing protection is measured in decibels
- The higher the number the greater the

What's wrong with this picture?



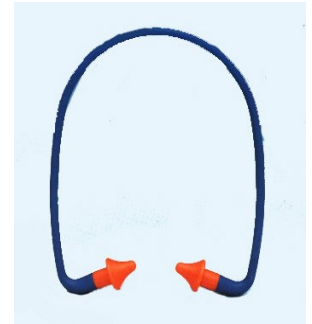
Photo Courtesy: USA

Personal Hearing Devices

- All personnel exposed to gun fire, artillery or missile firing in a training situation will wear hearing protective devices
- To achieve sufficient reduction to noise levels above 104 db (A) administrative controls will be implemented in the program

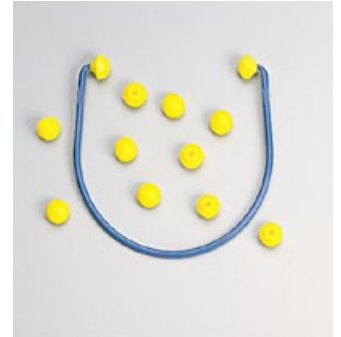
Personal Hearing Devices

- At a minimum, hearing protective devices will:
 - Provide adequate protection
 - Be durable
 - Be easy to clean
 - Be easily repaired



Personal Hearing Devices

- There are several types of hearing protection
 - ear muffs
 - earplugs
 - ear caps

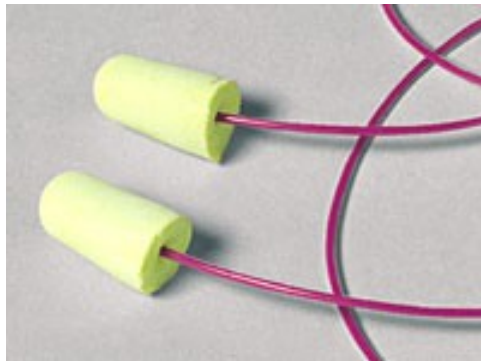
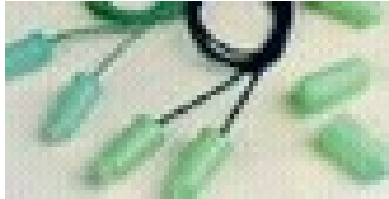


Ear Muffs



- Ear muffs cover the whole ear
- Replaceable pads
- Filter out specific noise pitches
- Glasses may interfere with proper sealing
- Last longer than most plugs

Ear Plugs



- Foam, rubber or plastic
- One-size-fits-all, small, medium and large
- Disposable and / or reusable
- Inexpensive and lightweight

Earplugs cont.



custom molded earplugs

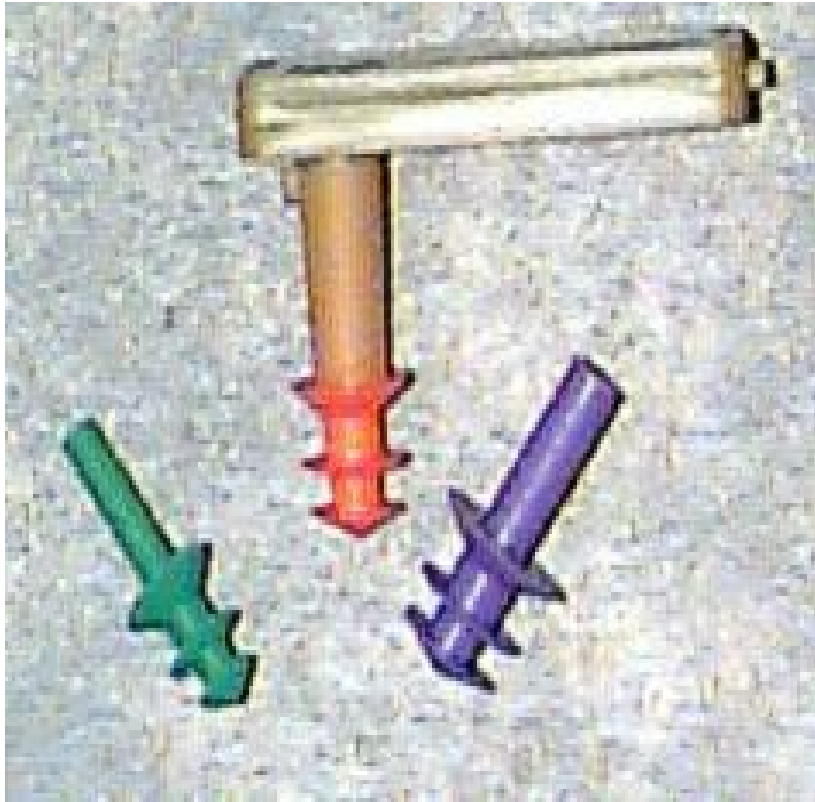
- Plugs may be uncomfortable to wear for long periods of time
- Rarely cause infection or prolonged irritation of the ear canal
- Find a comfortable fit by trying several different sizes, types or brands
- Custom-molded earplugs can be obtained for maximum comfort

Pre-formed Earplugs

- Single Flange:
 - 5 color-coded sizes:
 - White (Extra Small)
 - Green (Small)
 - Orange (Medium)
 - Blue (Large)
 - Red (Extra Large)



Pre-formed Earplugs



- Triple Flange:
 - 3 color coded sizes:
 - **Green** (Small)
 - **Orange** (Medium)
 - **Blue** (Large)

Earplugs cont.



- Foam type earplugs are one-size-fits-all and must be inserted properly into the



Earplugs cont.



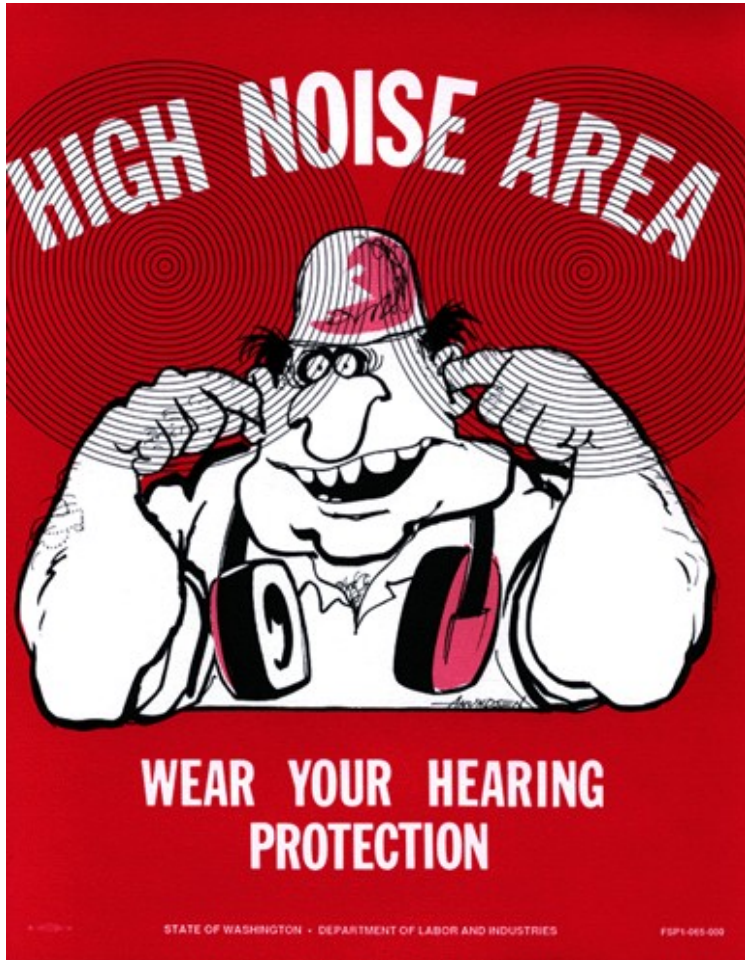
Earplug incorrectly inserted

Earplug correctly inserted

Abatement of Noise Hazards

- Engineering design to eliminate or reduce noise levels
- Damping the noise by means of mufflers, mountings, couplings, insulations, etc.
- Acoustical enclosures
- Isolation
- Substitution of a less noisy operation
- Administrative controls to limit exposure time

Funding



- Provided at government expense
- Operational and maintenance funds shall be used to purchase hearing protection

Record Keeping

- All records of hearing test will be kept in individual medical records until a new audiogram replaces it
- All noise measurements will be kept for the duration of employee's service plus **30 years**

Training

- All personnel in the Hearing Conservation Program will be notified and receive training in:
 - o The elements and rationale for the Hearing Conservation Program
 - o Proper wearing and maintenance of hearing protection devices
 - o Command and individual responsibilities
 - o Encouragement of using HPDs for off-duty activities

Training cont.

- o How hearing loss effects employability, retention, job performance and career progression
- o The effects of noise on hearing
- o The purpose of periodic audiometric testing and an explanation of the test procedures
- o The purpose, advantages, disadvantages, and attenuation of various types of HPDs
- o Instructions on selection , fitting, use, and care of HPDs

Responsibilities

- Military and civilian personnel
 - Wear HPDs when exposed to hazardous noise
 - Attend hearing tests and training as directed
 - Abide by the hearing conservation program requirements and make others aware of the need to wear HPDs in noise hazardous areas

References

- ◆ **NAVMC DIR 5100.8 OSH Program**
- ◆ **MCO 6260.1E**
- ◆ **OPNAVINST 5100.23G**
- ◆ **29 CFR 1910.95 Occupational Noise Exposure**

